



MO Risk-Based Corrective Action for Petroleum Storage Tank Sites - Preservation of Samples Analyzed for Volatile Organic Compounds

Hazardous Waste Program technical bulletin

4/2005

Which volatile organic compounds (VOCs) are evaluated under the MRBCA process?

Benzene, toluene, ethyl benzene, total xylenes, naphthalene, ethylene dibromide (EDB), ethylene dichloride (EDC), methyl tertiary butyl ether (MTBE), tertiary amyl methyl ether (TAME), tertiary butyl alcohol (TBA), ethyl-tert-butyl-ether (ETBE), diisopropyl ether (DIPE), ethanol, methanol, and gasoline range total petroleum hydrocarbons (TPH-GRO)

What preservative must be used for VOC samples?

Trisodium phosphate dodecahydrate, otherwise known as TSP. VOC samples shall not be acid-preserved.

Is TSP used for the preservation of both water and soil samples?

Yes, TSP should be used to preserve both water and soil samples. However, all soil samples to be analyzed for VOCs must be collected in accordance with SW-846 Method 5035. Using Method 5035, samples may be preserved either with TSP or by adding deionized water to the sample followed by freezing the sample. If the latter option is chosen, it is imperative that the sample be rapidly cooled in the field to 4° Celsius followed by the receiving laboratory freezing the sample soon after. While Method 5035 stipulates that sodium bisulfate be used to preserve soil samples, the Department of Natural Resources is hereby modifying the method by requiring preservation using TSP.

Why can't I preserve my samples with hydrochloric acid, like before?

Studies conducted by the U.S. Environmental Protection Agency and others have determined that acid preservation of water samples can result in hydrolysis of ethers in certain oxygenate compounds, in particular MTBE. Hydrolysis generally occurs when the sample is subjected to a heated purge prior to analysis. However, data also indicates acid-catalyzed hydrolysis can occur during sample storage. Regardless, ether hydrolysis can result in underestimation of ethers such as MTBE and overestimation of hydrolysis products such as TBA.

TSP raises the pH of a sample to greater than 11. This preserves the VOCs in the sample without the threat of ether hydrolysis.



When does the TSP requirement become effective?

In order to allow commercial analytical laboratories time to adjust to the TSP requirement, while the department strongly prefers that VOC samples be preserved using TSP immediately, data from samples preserved using HCl will be accepted by the department until April 30, 2005.

There might be exceptions to this general statement based on site-specific and laboratory-specific considerations (e.g., extraction temperature). If you are uncertain about the acceptability of analytical data, or should you have questions regarding this technical bulletin, please contact the department's project manager overseeing your particular site. The department's Tanks Section project managers may be reached at (573) 751-6822.

For more information call or write:

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